REMARKS - GENERAL

The inventor has amended claims 1-6 to clarify the distinction that only one "single" 2-d profile is required for the method of this invention. This distinction is discussed further hereafter.

Claims 10-14 were amended to correct a typographical error wherein these dependant claims inadvertently reference another dependant claim 14 when the inventor intended to reference the primary independent claim, claim 1.

Claim 18 was amended to remove a typographical error "8)'.

The claims have been amended using the "Bracket-and-Underscore Method".

In lieu of the citation of Hunter's patent regarding the use of a 3-d digitizer, the inventor has cancelled claims 19 and 20.

The inventor provides the following discussion to clarify the distinction between the novelties of this invention in comparison to the state of the art as represented by Hunters patent. Hunter's patent describes a 3-d digitization process that is presently the standard practice in the laser scanning industry. Hunter's patent pertains to a direct 3-d digitization process wherein a 3-d data is acquired directly from the object, which must be place in or on the 3-d digitization machine. Hunter describes the collection of multiple cross sectional scan data (col. 3, lines 54-56) using the plural form, "polylines which are sets of digitized X,Y,Z pointsets". Although the data may be captured in 2-D slices, or polylines, the data acquisition device acquires a "copious" cloud of data points to describe the entire object with the general exception of the face or area on which the part is resting or fixtured. While Hunter's claims use the broad term "light mensuration technique", laser digitization is the only "light" process that is supported by his specification. Thus, Hunter's data acquisition process requires that both the object and an expensive 3-D laser digitizer be at the same location. This means that the object to be

digitized must be shipped or otherwise transported to the location of the 3-D laser digitizer.

In contrast, the novelty of this invention comprises the combination of the 2-D digitization of a single profile, in conjunction with the measurement of a discrete number of parametric values. One specific advantage of this invention is the ability to capture the single 2-D profile by the very basic process of tracing and direct measurement of the parametric data. From the profile and parametric information, the required secondary profile is calculated, not digitized. The calculation of virtual surfaces enables the extrapolation, projection, or extension of objects that may not physically exist and would therefore be impossible to scan using the process described by Hunter. Another significant advantage of this invention is that the profile and parameter data can be defined anywhere without sophisticated equipment. This invention may utilize a typical flatbed scanner used for scanning 2-d profiles. Alternately the single profile (assuming it is in single external plane, can be digitized directly by placing the object on a flatbed scanner or by using a 2-d "tablet and stylus" type digitizer. Only the data need be transmitted to the service provider, which can be done by mail, e-mail, or by fax.

Responses to Specific Claim Rejections

The examiner has cited Hunter as;
1) Defining 2-dimensional profile representation of and object (col. 4, lines 1-31)
However, in this paragraph Hunter describes a process that begins with digitized 3-d data input, used to create a 3-D CAD model, which in turn can be used to "generate" as output, a two-dimensional (2-D) "blueprint" of the part.
Whereas defining a 2-D profile is an optional output of Hunter's process, defining and digitizing a 2-D profile representation is a critical input step in the structure and method of this invention.

The examiner has cited Hunter as;
2) Defining 3-dimensional parametric representations of an object (col. 4, lines 1-31)
However, in this paragraph Hunter describes a process for creating a mathematical representation in the form of a 3-D CAD model from the 3D laser scan point data.
In contrast, in the context of this invention, "defining 3-dimensional parametric representations" refers to the measurement and recording of a discrete number of key parametric dimensions. For example, the top, bottom, and side angles of a gunstock, or the diameters at points along the length of a gun barrel, are parametric values required as inputs for the process of this invention. These dimensions can be measured directly of the physical part using simple conventional tools such as protractors, micrometers, calipers, scales, or tape measures, whereas Hunters process requires a 3-d laser scanner.

The examiner has cited Hunter as;
3) Converting the profile and parametric data into an electronic format suitable for input to computer aided design and manufacturing (CAD/CAM) programs (col. 4, lines 1-31)
However, in this paragraph Hunter describes a process for converting digitized 3-D point cloud data into 3-D surface model. Hunter's process comprises the calculation of mathematical surfaces that encompass or most closely approximate all of the 3-d scan data points. Each of the data points comprise only (x,y,z) coordinates with neither

magnitude nor direction. In contrast, the process described in this invention pertains to extrapolating a surface based solely on a single 2-D digitized profile and a discrete minimum number of characteristic parametric dimensions. By defining the location and orientation at which these parametric values are measured, the result is a directional vector. For example; in the case of fitting recoil pads to gunstocks, the measurement of the left side angle of the gunstock is taken at a position approximately equidistant between the top and bottom of the gunstock, perpendicular to the tangent of the 2-d profile at that position. A secondary profile is calculated in a plane offset from, and preferably but not necessarily parallel to, the plane of the original profile. The secondary profile is a modified form of the original profile, variably rescaled to encompass the exact points at the intersection of the secondary plane with the angle vectors. A fully defined 3-d surface can be extrapolated between these two profiles.

Referring to claims 2,3, and 7, the examiner credits Hunter with disclosing the method of claim 1, wherein step 1 comprises a tracing technique and a digitizing device to define the 2-dimensional profiles (col. 2, lines 3-8).
Hunter neither describes nor implies any such "tracing technique", which in the context of this invention refers to the common definition - the process of following the contour of an object with a marking stylus (in contact) in order to create a 2-d representation. Rather, Hunter describes a means and method of gathering, processing, and using 3-D data via a non-contact laser digitizer.

The examiner credits Hunter with disclosing the method of claim 1, wherein step 2 is facilitated by means of printed measuring utensils.
The inventor takes exception to this citation, which has no reference, and certainly no relevance with respect to Hunter's disclosure or anticipation of the novel "printable protractor" or "printable measuring grids" of this invention.

Referring to claims 4-6,8,9, and 14, the examiner credits Hunter with disclosing the method of claim 1, wherein step 1 comprises an optical scanning process and exposure to reactive chemical media to define the 2-dimensional profiles (col. 4, lines 46-62).

The inventor takes particular exception to this citation. Whereas Hunter was referring to printing a "blueprint" as an output to his process, The use of reactive chemical media in the context of this invention pertains to capturing the 2-d profile of the object as required as an input to this process.

Although Hunter discloses the method of claim 1, wherein step 1 and step 2 comprise a digitizing device to define the 2-dimensional profiles (plural), he does not disclose or imply the intent or ability to extrapolate a 3-D model from a single digitized 2-D profile in conjunction with a discrete number of parametric measurements. In fact Hunter's only reference to the term "parameter(s)" or "parametric" is in his citation of the prior art capabilities of software capable of the "parameterization" of raw 3-d point data.

The examiner credits Hunter with disclosing the method of claim 1, wherein step 1 and step 2 are facilitated by means of an integrated instruction and data acquisition form (col. 3, lines 10-15). Whereas this particular claim of this invention is based on the novel use of an integrated data acquisition and instruction forms for specific applications, the examiner has cited Hunter's use of a generic computer workstation as grounds for rejection.

The examiner credits Hunter with disclosing the method of claim 14, wherein step 6 comprise a CNC controlled Rapid Prototyping machine capable of directly producing a part (col. 4, lines 46-62). No such reference is made or implied. In the context of this invention the term Rapid Prototype is defined as an additive or deposition process machine in contrast to the machine described by Hunter, which clearly describes a conventional "machining" process, wherein "chips" are removed from an oversized piece of stock in a "subtractive" process.

Request for Constructive Assistance

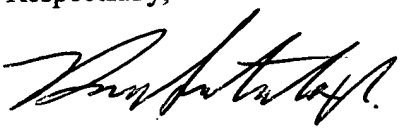
The undersigned has made a diligent effort to amend the claims of this application so that they define a novel and unobvious structure. If, for any reason the claims of this

application are not believed to be in full condition for allowance, the applicant respectfully requests the constructive assistance and suggestions of the Examiner in drafting one or more acceptable claims pursuant to MPEP 707.l07(j) or in making constructive suggestions pursuant to MPEP 706.03(d) in order that this application can be placed in allowable condition as soon as possible and without the need for further proceedings.

Notification of change of Address:

Please note that the applicant/inventor has changed his address and telephone number to that listed bellow.

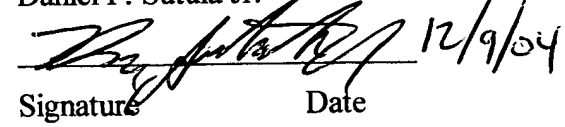
Respectfully,



Daniel P. Sutula Jr.
Applicant Pro Se

11 Revere Drive
Bristol CT 06010
(860) 314-1390

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail in an envelope addressed to:
Commissioner of Patents and Trademarks, Washington D.C. 20231
on December 9, 2004
Daniel P. Sutula Jr.



Signature Date